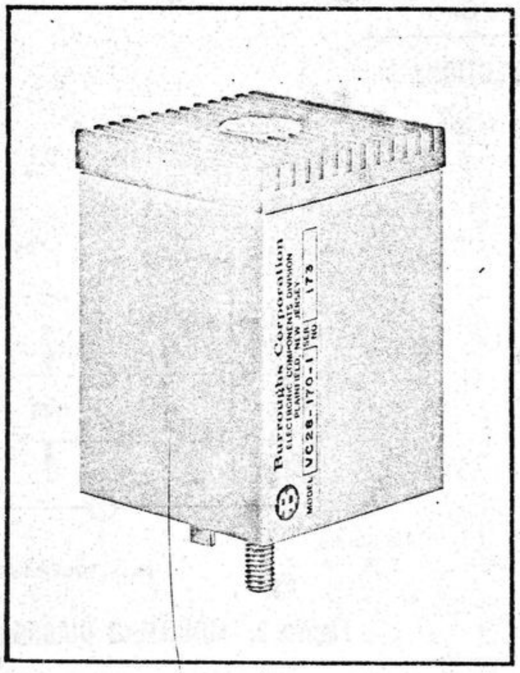
BULLETIN NO. 1087
May 30, 1965

READOUT DEVICES



DC-DC CONVERTER

Types VC 12-170-1 and VC 28-170-1

The DC-DC Converter Modules, types VC12-170-1 and VC28-170-1, accept −12 Vdc and −28 Vdc, respectively, and provide +170 Vdc output voltage suitable to operate NIXIE® tubes and BIPCO® driver modules. The converters are intended for use where a high level DC voltage is not available. Voltage level conversion is obtained by means of a transistor oscillator, transformer and rectifier technique. (Figures 3 and 4).

ELECTRICAL SPECIFICATIONS

INPUTS	VC12-170-1	VC28-170-1
Voltage (±5%)	−12 Vdc	−28 Vdc
Current (max.)	750 ma	300 ma

OUTPUTS	VC12-170-1	VC28-170-1
Voltage (Full Load)	170 Vdc min.	170Vdc min.
(No Load)	200 Vdc	200 Vdc
Current (Full Load)	30 ma max.	30 ma max.
Impedance	300 ohms typ.	600 ohms typ.
Ripple (Full Load)	4 Vpp max.	4 Vpp max.

MECHANICAL CHARACTERISTICS

Outline Drawing	Figure 1
Terminal Connections	Table 1
Mounting Diagram	Figure 2

Temperature — Operating	0° to +55°C
Non-Operating	−65° to + 100°C
Weight	4 oz. nom.

APPLICATION NOTES

The VC12-170-1 and VC28-170-1 voltage converters can be used with any NIXIE tube which has a minimum ionization voltage rating of 170 volts or less. The output voltage of these converters decrease approximately 1 volt for each 1 ma of load current, therefore, the size of the current limiting anode series resistance will depend on the number and type of NIXIE tubes being driven.

The size of the appropriate anode resistance is determined as follows:

The amount of load current required by the converter is obtained by multiplying the number of NIXIE tubes by the nominal cathode current for each tube.* For example, the standard rectangular NIXIE tube, type 8422 (B-5991) has a typical cathode current of 2.2 ma. If 6 tubes are to be driven by the converter, the load current would be 13.2 ma (6 x 2.2) and the converter output voltage would be 186.8 Vdc (200 − 13.2). The current limiting series resistance for the type 8422 is 8.2 K at 170 V.* Since the supply voltage is greater than 170 V, the series resistance must be increased so that the average current through the NIXIE tube will not change. In this example, an additional 16.8 V (186.8-170) drop across the series resistor is needed. In other words, the additional series resistance required is about 7.6 K ohms (16.8V/2.2 ma) making a total series resistance for each tube of 15.8K (7.6 + 8.2). Note: the closest standard value can be used (16K in this example).

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* NIXIE tube specifications can be found in Brochure 616.

CONNECTION	PIN
"–" input	1
"+" input	2
"+" output	3
"–" output	4
Ground	Case

Table 1. TERMINAL CONNECTIONS

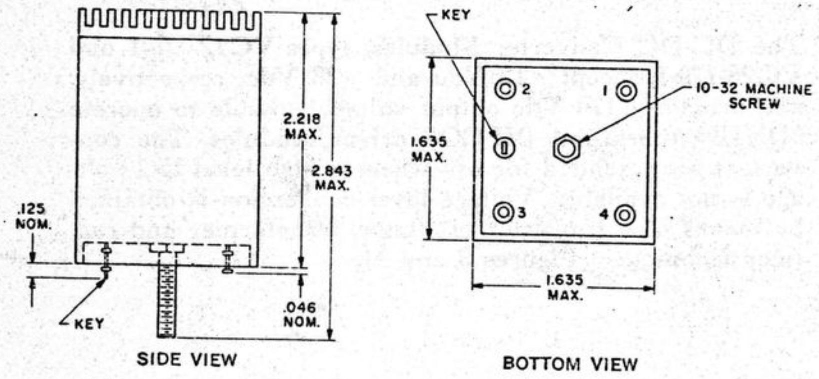


Figure 1. OUTLINE DRAWING

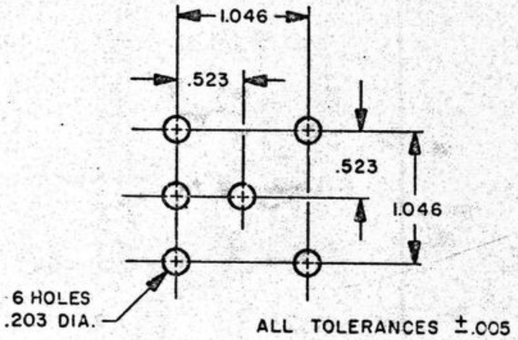
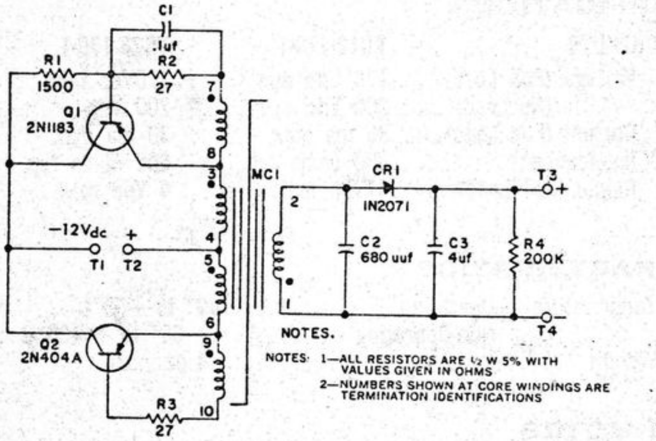


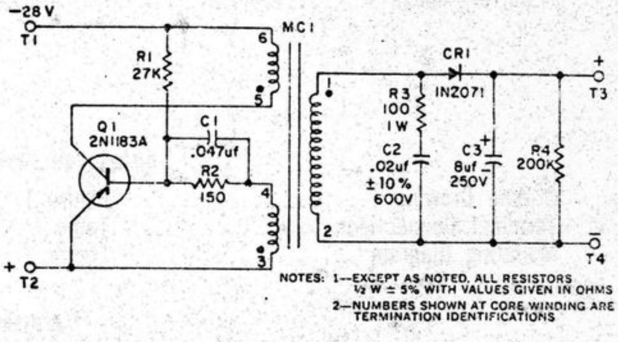
Figure 2. MOUNTING DIAGRAM



NOTES.

NOTES: 1—ALL RESISTORS ARE ½ W 5% WITH VALUES GIVEN IN OHMS
2—NUMBERS SHOWN AT CORE WINDINGS ARE TERMINATION IDENTIFICATIONS

Figure 3. VC12-170-1 SCHEMATIC DIAGRAM



NOTES: 1—EXCEPT AS NOTED, ALL RESISTORS ½ W ± 5% WITH VALUES GIVEN IN OHMS
2—NUMBERS SHOWN AT CORE WINDING ARE TERMINATION IDENTIFICATIONS

Figure 4. VC28-170-1 SCHEMATIC DIAGRAM

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